

Reconsider B-Vitamins Play a Vital Role in Maintaining Good Health and Well-Being

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Abstract

This review is to provide the information to alert of the vitamin B-group of dietary intake, and supplement intake should be reconsidered, discussing the potential deficiency factors of vitamin B-group and some ideas about promoting human health and prevention of the disease.

Keywords: Coenzyme; B-vitamin; Blood; Oxygen; and Bioavailable

Background

The medicinal condition of a heart attack; a stroke is a lack of oxygen; refer to the blood vessel blocks of the delivery of oxygen-rich blood to critical tissues [1]. Blood is a vehicle to carry oxygen, as we know. Therefore, it is essential to make more red blood cells or generating new blood vessels to carry on oxygen to critical issues. Vitamin B-group has recognized the essential ingredients to produce red blood cells to carry the oxygen to deliver it to body tissues as needs [2]. Vitamin B-group of nutrients helps to plan the optimal balance diet for promoting human health and prevention of the disease. This review is to provide the information related to the vitamin B-group of function and cause of deficiency and dietary of the resource. The goal is to alert of vitamin B-Group of dietary intake of play a vital role in our daily function.

Thiamine (Vitamin B1)

Vitamin B1 is one of the chemical ingredients of the Pyruvate Dehydrogenase Complex, as cofactors thiamine pyrophosphate (TPP) with magnesium to assists in macronutrient metabolism [3]. There are specific pathologies associated with vitamin B1 deficiency, for example, a neurological problem with a cognitive deficit, and encephalopathy [4]. There are various interactions between the nervous system and the immune system; besides, deficiency in vitamins B1 has linked to depression [5]. In classical, Wernicke-Korsakoff syndrome is caused by a lack of intake of Vitamin B1. TPP associated enzymes being dysfunction is called beriberi with prolonged Vitamin B1 of deficiency that can result in the diseases. Dry-beriberi, when you would have a decrease of fluid, which would present with muscle wasting, polyneuritis of condition, is occurring in Partial paralysis from nerve damage. Then there is a wet berry associated with an accumulation of fluid, which would present with a dilated cardiomyopathy as well as edema.

Thiamine-responsive megaloblastic anemia (TRMA) syndrome is a rare autosomal recessive disorder and diabetes mellitus, which is related to deficiency Vitamin B1 [6].

Riboflavin (Vitamin B2)

Vitamin B2 has two activity forms of Flavin mononucleotide (FMN), Flavin adenine dinucleotide (FAD); two bioactive vitamin B2 coenzymes are going to be used generally for "Redox", chemistry transferring electrons for energy production to maintain a healthy metabolism [7]. Vitamin B2 is an essential cofactor for glutathione antioxidants, detoxication agents in the liver [8]. Vitamin B2 is responsible for converting folate, niacin, vitamin B6, and vitamin K into their Active forms [2]. There are specific pathologies associated with vitamin B2 deficiency. A lack of intake of vitamin B2 causes destroys mucosal membranes in the digestive system; inflammation of the mucosa of the mouth and tongue and dermatitis, and symptoms may include cracking on the tongue and at the corners of the mouth [9]. Vitamin B2 enhances the absorption of iron; deficiency reduces the mobilization of iron from the store, and low red blood cells or hemoglobin in the blood are associated with the onset of anemia [10]. Deficient of Vitamin B2 is causes cloudy to vision and damage to eye lens called cataracts [11]. Promotes growth and regeneration daily replenishment of vitamin B2 is essential for both growth and matinee individuals. Vitamin B2 intake enhances the activity of enzymes that boost the activation of natural antioxidants present in the body [12]. These antioxidants promote the elimination of free radicals and protect brain cells against damage and death for maintaining proper energy levels [12]. Utilizing oxygen, vitamin B2 converts hydrogen from nutrients into energy. Alcoholics are at particular risk for vitamin B2 of deficiency due to Alcohol's interference with vitamin Metabolism [13].

Vitamin B6 (Pyridoxine, Pyridoxal, Pyridoxine)

Vitamin B6 of Pyridoxal 5'-phosphate is the metabolically active form. That is involved in cofactor enzymes function to converses

the amino acid tryptophan to niacin or the neurotransmitter serotonin [9]. The activation of glycine in the initial stages of heme production needs to the formation of blood to preventing anemia [14]. Vitamin B6 has a function of transamination of amino acids to keto-acids, which can add and remove amino groups in protein and urea metabolism [15, 16]. Vitamin B6 has decarboxylation of phosphatidylserine to phosphatidylethanolamine in phospholipid synthesis, which is then oxidized and used as metabolic fuel for body energy to maintain healthy blood sugar levels, and the nucleic acid formation and lecithin [17]. Vitamin B6 is a cofactor involving side-chain cleavage, including cystathionine synthase and cystathionine. There are specific pathologies associated with vitamin B6 deficiency. Hyper-homocysteinemia is controlling by vitamin B6; high levels of plasma homocysteine are cause cardiovascular risks [18]. The transculturation pathway, which converts homocysteine into cystathionine, which is cystathionine is an intermediate in the synthesis of cysteine, produces Cystathionine. It is also producing tryptophan a critical the nervous system hormone, and its impacts on tryptophan metabolism to reduce depression by releasing serotonin [19, 20]. Vitamin B6 of Clinically deficiency caused the Carpal Tunnel Syndrome (CTS) [21].

Vitamin B12 (Cobalamins)

Vitamin B12 has the complex absorption mechanisms, Trans-cobalamin II and trans-cobalamin I responsible for the delivery of vitamin B12 to go peripheral tissues and the liver, respectively [22]. Vitamin B12 functions in folate metabolism and helps to maintain the myelin coating in the body's nervous system [23]. A well-known cause of vitamin B12 insufficiency of pernicious anemia with autoimmune destruction of parietal cells, consequent impairment of intrinsic factor secretion [24]. Vitamin B12 deficiency also occurs from inadequate dietary intake with malnourished of the elderly, and with alcohol excess [25]. A recent systematic review confirmed the link between metformin treatment and low serum cobalamin levels but highlighted that an association between vitamin B12 deficiency and clinical symptoms remains controversial [26]. The deficiency vitamin B12 caused increase serum homocysteine to lead to the risk of development of cardiovascular disease with type 2

diabetes mellitus. The most typical cause is food-bound cobalamin malabsorption (FBCM) of medical conditions to lead to decreased secretion of Hydrochloric acid, thereby reducing the liberation of vitamin B12 from food proteins [27].

Highest Bioavailable of Nutrients in the Foods

In the above information, Vitamin B-group has a function to assist in neurological function, produced healthy red blood, and energy metabolism in the cells to assure our optimal daily activity. Good news to most of the people with Vitamin B-group of the deficiency is preventable. In our lives, more than anything else, the foods we eat daily help determine whether to be healthy or not or remain healthy into older age. There are many of the highest bioavailable of vitamin B-group of nutrients in the foods. American of the Institute of Medicine of The National Academies has developed a guide for the vitamin B-group intake on a scientific basis; it is called Dietary Reference Intake (DRI). Table 1 Summarize DRI of recommended intake Vitamin B-group for the men, women, and highest bioavailable of nutrients in the foods. Vitamin B1, 2 require an increase with an excessive intake of carbohydrates. The vitamin B6 obtained from animal foods and fortified foods tend to be better absorbed than that obtained from plant foods. About 75% of vitamin B6 from a mixed diet is bioavailable. There is not present Vitamin B12 within the plant of foods. In the market sale, the fortified with vitamin B12 breakfast cereals with high bioavailable for vegetarians, there are fortified foods with vitamin B12 vary in the formulation. Vitamin B-group is a vitamin of a water-soluble the body well regulates that; thus, an overdose is rare to happen and usually only occur with vitamin B injections or supplements.

Conclusion

Vitamin B-group is interaction with our body chemistry, a hormone to maintain our body for optimal function. However, how much is enough? Our body changes may correlate with we intake vitamin B-group, all of which discussed herein. We need to study the matter furthermore in nutrients reference intake to provide the most useful science basics of information to the people.

Table 1: DRI of recommended intake Vitamin B-group for the men, women, and highest bioavailable of nutrients in the foods

	Men	Women	Food Resource
VitaminB1	1.2mg/day	1.1 mg/day	Pork loin, beans, sweet potato, sunflowers. fortified bread
VitaminB2	1.3 mg/day	1.1 mg/day	Beef of liver. Mushrooms, pork chops, spinach, Fortified bread
VitaminB6	1.3mh/day	1.3mg/day	Beef liver, pork loin, organ meats. Fortified bread
VitaminB12	2.4 micrograms/day	2.4 micrograms/day	Lamb, Pork of Rabbit. Goose of smoked. Oysters. Mussel

Adapted from McGuire M, Beerman K (2018) Table of food composition for nutritional sciences. www.cengage.com/wadsworth

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